



ADDENDA REPORT
IFB No. 2025-266
Building Automation System (BAS) Upgrades

RESPONSE DEADLINE: October 30, 2025 at 2:00 pm

Wednesday, November 5, 2025

Addenda Issued:

Addendum #1

Oct 1, 2025 10:34 AM

Addendum No. 1 includes the following updates:

- Revisions to the MEP specifications (see the engineer's memo for details);
- An additional non-mandatory site walk scheduled for Tuesday, October 7, 2025;
- An extension of the Q&A period from Thursday, October 2, 2025, to Thursday, October 9, 2025, at 5:00 PM; and
- A revised bid due date, extended from Thursday, October 9, 2025, to Thursday, October 16, 2025, at 2:00 PM.

Attachments:

· [IFB 2025-266 BAS Upgrades \(Admin Building\) - Addendum 1](#)

Addendum #2

Oct 14, 2025 4:24 PM

Addendum No. 2 extends the bid submission deadline from Thursday, October 16, 2025, to Thursday, October 23, 2025, at 2:00 PM.

Addendum #3

Oct 21, 2025 11:51 AM

Addendum No. 3 includes the following updates:

- The engineer's response to the Honeywell Optimizer product substitution request (see form attached).
- A revised bid due date, extended from Thursday, October 23, 2025, to Thursday, October 30, 2025, at 2:00 PM.

Attachments:

· [Honeywell Optimizer Substitution Request Approved](#)



ADDENDUM 1

PROJECT TITLE: 2025-266 BAS Upgrades

MD PROJECT #: 251778

DATE: September 28, 2025

Questions/Clarifications:

Item No.1 For the Fire/Smoke DDC controller, it is required by code to install a UUKL, or UL864, rated controller. I have contacted Honeywell and they do not offer a UUKL rated controller. Will a Distech ECB UUKL rated controller be acceptable in its place for this controller set only?

Response: Yes this is acceptable.

Item No.2 The spec says to use BACnet MS/TP as the communication protocol. If the controls contractor is able to set up all the IP addressing network and the County provide (1) IP address to connect to the JACE for full access to the entire system, will this be acceptable? Additionally, would BACnet/T1L be accepted? T1L is where you reuse any existing communication wiring and connect to a media convert from RJ-45 (ethernet) to T1L. This basically using 2-wire cable to produce BACnet/IP without using ethernet cables. This would require reusing all the existing communication wiring.

Response: This method of connection is acceptable to the County. All systems shall function properly and communicate back to the JACE so Collin County Integrator can map existing points back the county network.

Item No.3 Modify specification section 23 09 04, paragraph 2.2 to remove the reference to Honeywell JACE-8000 and replace with the reference Honeywell JACE-9000

Response: See attached revised specification section.

Item No.4 Modify specification section 23 09 04, paragraph 2.3 to remove the reference to Honeywell Spyder and replace with the reference Honeywell Sylk

Response: See attached revised specification section.

This concludes Addendum 1 items for the referenced project.

Sincerely,

MD Engineering, LLP

Michael Smith, PE LEED®AP
President



SECTION 23 09 00 – INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to the Work in this Section.

1.2 SUMMARY

- A. This Section includes control equipment for HVAC systems, components and other systems shown to be controlled by the Building Automation System (BAS), including, but not limited to, all computer software and hardware, controllers, sensors, transmission equipment, local panels, installation, engineering, supervision, commissioning, acceptance testing, training and warranty service necessary for a complete and working system.
- B. The Contractor shall furnish and install the controls including all necessary hardware and all operating and applications software necessary to perform the control sequences of operation as specified in Division 23 Section "Sequence of Operations for HVAC Controls". The controls contractor shall coordinate all work with the stand-alone controls provided with the equipment being controlled.
- C. The intent is that all facility operations new or existing would be stand-alone.
- D. All components of the system – local controllers, unitary controllers, etc. shall communicate using the BACnet protocol, as defined by the most current edition of ASHRAE Standard 135 and as specified herein or equal. Proprietary communications shall not be acceptable.
- E. OPEN NIC STATEMENTS - All Niagara 4 software licenses shall have the following NiCS: "accept.station.in=*"; "accept.station.out=*"and "accept.wb.in=*"and "accept.wb.out=*". In any case, the end user shall maintain the right to instruct the contractor to modify any software license, regardless of supplier, as desired by the end user. The contractor shall not install any "brand-specific" software, applications, or utilities on Niagara Framework-based devices. All hardware and field-level devices installed shall not be limited in their ability to communicate with a specific brand of Niagara Framework JACE. They shall also be constructed in a modular fashion to permit the next generation and support components to be installed, in replacement of or in parallel with existing components. All controllers must be able to be programmed within the Niagara Workbench. At the completion of the project, the owner shall be given all existing platform and station login credentials to include; super user (admin) user names; passwords and passphrases.
- F. The BAS contractor shall review and study all drawings and the entire specification to become familiar with the equipment and system operation and to verify the quantities and types of controllers and devices to be provided.
- G. All interlock, control and power wiring and installation of control devices associated with the equipment described in this specification, and sequence of operations, shall be provided under this Contract.
- H. The integration of the controls into the Owners software will be handled by the County's integrator.
- I. Provide services and manpower necessary for commissioning of system in coordination with the Owner's Representative and Owner's Integrator.
- J. All work performed under this section of the specifications will comply with all codes, laws and governing bodies. If the drawings and/or specifications are in conflict with governing codes, the Contractor shall submit a proposal with appropriate modifications to the project to meet code restrictions. If this specification and associated drawings exceed governing code requirements, the specification will govern. The Controls Contractor shall obtain and pay for all necessary construction permits and licenses associated with this scope of work.

COLLIN COUNTY BAS UPGRADE FOR JACK HATCHELL ADMINISTRATION BUILDING

1.3 QUALITY ASSURANCE

- A. Building Automation System (BAS) shall be manufactured, tested and installed in accordance with the following standards:
 - 1. National Electrical Manufacturers Association (NEMA).
 - 2. Underwriters Laboratories (UL).
 - 3. BACnet Testing Laboratories (BTL).
 - 4. National Fire Protection Association (NFPA).
- B. BAS System Supplier:
 - 1. A firm having 5 years of successful installation, configuration and integration experience with projects utilizing equipment similar in type and scope to that required for this Project.
 - 2. Certified for configuration of building management systems of Section 23 09 00 - Instrumentation and Control for HVAC Direct Digital Control System for HVAC by the manufacturer's representative.
 - 3. Provide specified products of types and sizes required from manufacturers whose products have been in satisfactory use in similar service for a minimum of 8 years.
 - 4. Be the system supplier for Section 23 09 00 - Instrumentation and Control for HVAC Direct Digital Control System for HVAC.
- C. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.
- D. Upon completion of the installation, the Contractor shall thoroughly inspect, check, adjust, calibrate, and make ready for use all devices/sensors comprising the control system and certify that they are installed in accordance with "Record" Drawings.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- F. Data Communications Protocol: Certify that each proposed Controls system component complies with ASHRAE Standard 135 for each protocol.
- G. Controls system component testing: Comply with ASHRAE 135.1 and all addenda for all controllers.
- H. All controllers used to control or monitor equipment and/or field devices shall be tested, compliant with and carry the mark of the BACnet Testing Laboratories (BTL):
 - 1. Building Controllers.
 - 2. Advanced Application Controllers.
 - 3. Application Specific Controllers.
- I. Quality Management Program
 - 1. Designate a competent and experienced employee to provide BAS Project Management. The designated Project Manager shall be full time on this project and be empowered to make financial, technical, scheduling and related decisions on behalf of the BMS Contractor. At minimum, the Project Manager shall:
 - a. Serve as the point of contact for the Construction Team.
 - b. Manage the scheduling of the work to ensure that adequate materials, labor and other resources are available when needed.
 - c. Lead and be involved in the coordination efforts with other trades.
 - d. Be responsible for the work and actions of the BAS workforce on site.
- J. As evidence and assurance of the Contractor's ability to support the project's Commissioning efforts, the Contractor must have successfully completed three commissioned projects totaling at least the value of this contract, as a minimum.

1.4 SUBMITTALS

- A. Provide submittals as required in Section 23 00 10, "Submittal Process".

COLLIN COUNTY BAS UPGRADE FOR JACK HATCHELL ADMINISTRATION BUILDING

- B. Product Data: For all products listed in Part 2 below provide detailed manufacturer product data, technical literature indicating dimensions, finishes, material, weights, performance characteristics, electrical characteristics, capacities, loads, required clearances, method of field assembly, components, and location and size of each field connection. Include manufacturer's technical literature for each control device. Indicate finishes for materials, and installation and startup instructions for each type of product indicated.
 - 1. Control System Software: Include technical data for operating system software, operator interface, color graphics, and other third-party applications including all software licensing agreements.
 - 2. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic control diagram.
- C. Shop Drawings:
 - 1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
 - 2. Wiring Diagrams: Power, signal, and control wiring.
 - 3. Conductor numbering or color code schedules.
 - 4. Details of control panel faces, including controls, instruments, and labeling.
 - 5. Schedule of identification labels for controllers and devices.
 - 6. Controlled Systems:
 - a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
 - b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
 - c. Written description of sequence of operation including schematic diagram.
 - d. Points list.
 - 7. Submit hard and soft copies in file format compatible with AutoCAD 2012.
- D. Data Communications Protocol Certificates: Certify that each proposed control system component complies with ASHRAE Standard 135 for each protocol.
- E. Software and Firmware Operational Documentation: Include the following:
 - 1. Software operating and upgrade manuals.
 - 2. Program Software Backup required to reinstall and configure system in the event of a catastrophic failure: On CD, complete with data files.
 - 3. Device address list.
 - 4. Printout of software application and graphic screens.
 - 5. Software license required by and installed for operator workstations and control systems.
- F. Software Upgrade Kit: For Owner to use in modifying software to suit future systems revisions or monitoring and control revisions.
- G. Field quality-control test report forms.
- H. Contract Closeout Documentation:
 - 1. Operation and Maintenance Data: Include emergency, operation, and maintenance manuals.
 - a. Maintenance instructions and lists of spare parts for each type of control device.
 - b. Interconnection wiring diagrams with identified and numbered system components and devices.
 - c. Keyboard illustrations and step-by-step procedures indexed for each operator function.
 - d. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
 - e. Calibration records and list of set points.
 - 2. Training provided by BAS installer.

COLLIN COUNTY BAS UPGRADE FOR JACK HATCHELL ADMINISTRATION BUILDING

1.5 WARRANTY

- A. Controls Contractor shall guarantee all system components and installations to be free from defects for one (1) year from the date of acceptance as determined by the Owner. Any defects found during this period shall be repaired and/or replaced at no cost to the Owner. The Controls Contractor shall provide maximum of 24-hour response time for trouble calls or maintenance.
- B. Controls Contractor shall provide all corrective software modifications or updates available from the software manufacturer during warranty service periods. All user documentation shall be updated on user and manufacturer backup software disks.

1.6 SPECIAL TOOLS AND SPARE PARTS

- A. Contractor will provide a recommended spare parts list with the following information.
 - 1. Contact Information: Closest parts stocking location to the Owner.
 - 2. Identify Critical Spare Parts: Parts being associated with long lead times and/or those critical to system operation.
 - 3. Maintenance Spares: Identified as being parts required to regularly perform scheduled maintenance on furnished equipment. Spares include, but not limited to, consumable spares required to be exchanged during scheduled maintenance periods.
- B. Spare Parts: Provided for each type and size of unit installed.
 - 1. Provide minimum spare parts recommended by manufacturers.
 - 2. Provide 1 set of each type of power and control fuse installed within equipment.
 - 3. Properly marked and packaged for long term storage.
 - 4. Printed circuit boards: Provided in separate anti-static containers.
- C. Special Tools: Specific tools, not normally found in an electrician's toolbox, required to remove, and install spare parts must be furnished.
- D. Provide PC-based computer configuration software, or mobile device App tool, and a minimum of one communication interface cable for each type of cable required to connect the computer/device to devices specified for configuration and programming.
- E. Provide Cloud-based SAAS configuration software and Cloud based Engineering platform required to connect and design devices specified for configuration and programming.
- F. Electronic configuration files, in a media format acceptable by the Owner (e.g. CD, USB stick, etc.), updated to an as-installed and commissioned state.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design – Honeywell Controls
- B. Installers shall be factory authorized for installation of Honeywell Controls

2.2 MANAGEMENT LEVEL CONTROLLERS

- A. Basis of Design: Honeywell JACE 9000 Controller: Compact, embedded Niagara Framework based controller and server platform. Connects multiple diverse devices and sub-systems. Requires additional core software and service maintenance licenses.
 - 1. Model JACE-9000-CSE: Unlicensed controller, 2 RS-485 ports, 2 10/100 MB Ethernet ports, USB backup and restore, Wi-Fi connectivity (US).
 - 2. Internet connectivity and web-serving capability.
 - 3. Integrated control, supervision, data logging, alarming, scheduling, and network management.
 - 4. Stream data and rich graphical displays to web browsers via ethernet or wireless LAN, or over the internet.
 - 5. Licensing Model: Standard drivers with optional IO and field bus expansion modules for flexibility and expandability.

6. Optimized for the Niagara 4 platform. In large and multi-building applications, use Niagara 4 Supervisors with JACE 9000 controllers to aggregate information, including alarms and data: historical and real-time, creating a single, unified application.
7. Standards Compliance and Certifications:
 - a. UL 916.
 - b. CE EN 61326-1.
 - c. RCM.
 - d. FCC Part 15 Subpart B, Class B.
 - e. FCC Part 15 Subpart C.
 - f. C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983."Signal Equipment."
 - g. 1999/5/EC R&TTE Directive.
 - h. CCC.
 - i. SRRC.
 - j. RSS.
 - k. RoHS.
8. Environmental:
 - a. Operating temperature: Minus 4 to 140 degrees F (Minus 20 to 60 degrees C).
 - b. Storage temperature: Minus 40 to 185 degrees F (Minus 40 to 85 degrees C).
 - c. Humidity: 5 to 95 percent, non-condensing.
 - d. Shipping and vibration: ASTM D4169, Assurance Level II.
 - e. MTTF: 10 plus years.
9. Technical Specifications:
 - a. 1.6GHz NXP iMX8M+ Quad Core CPU.
 - b. Removable micro-SD card with 4GB flash total storage/2GB user storage.
 - c. Wi-Fi (Client or WAP).
 - 1) IEEE802.11a/b/g/n.
 - 2) IEEE802.11n HT20 at 2.4GHz.
 - 3) IEEE802.11n HT20/HT40 at 5GHz.
10. Configurable radio (Off, WAP, or Client) WPAPSK/WPA2PSK supported.
 - a. USB Type A Connector: Back-up and restore support.
 - b. Two isolated RS-485 with selectable bias and termination.
 - c. Two 10/100MB Ethernet ports.
 - d. Secure boot.
 - e. Supply Requirements: 24 VAC rated at 24 VA minimum, or 24 VDC rated at 1A.
 - f. Power: 24 W minimum.
 - g. Runs Niagara 4: 4.13 and later.
 - h. Wifi supports Niagra 4.15 and later
 - i. Niagara Analytics 2.0 requires Niagara 4.2 and later.
 - j. Real-time clock.
 - k. No battery.

2.3 PROGRAMMABLE FIELD EQUIPMENT CONTROLLER (FEC)

- A. Description: BACnet programmable VAV/Unitary controller
- B. Basis of Design: Honeywell Syk.
- C. The FEC controllers are BACnet MS/TP network devices designed to control HVAC equipment. Each FEC controller is programmable and configurable through software.
- D. The FEC BACnet controllers shall have the BACnet Programmable Feature to be licensed in the WEBpro workbench tool and the WEBS AX JACE Controller for programming and downloading

- E. The FEC shall include an integral real-time clock and support time-based tasks which enables these field controllers to monitor and control:
 - 1. Schedules
 - 2. Calendars
 - 3. Alarms
 - 4. Trends
- F. The FEC can operate as a stand-alone controller in applications that do not require a networked supervisory device or for network applications where it is preferred to have the scheduling, alarming, and/or trending performed locally in the field controllers.

2.4 ELECTRONIC SENSORS

- A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.
- B. Thermistor, Temperature Sensors and Transmitters:
 - 1. Sensor Types: Provide one of the following:
 - a. 100 ohm (+/-0.12%) platinum resistance temperature detectors having a coefficient of resistivity of 0.00385 ohms/ohm/°C. Provide RTD temperature transducers with of 4-20 mA output signal variations of less than 0.2% of full scale output for supply voltage variations +/-10% and integral and accessible zero and span adjustment.
 - b. 10,000 ohm thermistor having an accuracy of .5°F at calibration point of 75°F may be used for room temperature only.
 - 2. Accuracy: Plus or minus 0.5°F (0.3°C) at calibration point.
 - 3. Wire: Twisted, shielded-pair cable.
 - 4. Insertion Elements: Single point in center of duct or coil face area, use where not affected by temperature stratification or where airflow cross sectional area is smaller than 9 sq. ft.
 - 5. Averaging Elements: Twice the diagonal length of coil or duct. Use where prone to temperature stratification or where airflow cross sectional area is larger than 10 sq. ft.
 - 6. Insertion Elements for Liquids: Brass or stainless-steel socket with minimum insertion length of 2-1/2 inches or 75% of pipe inside diameter, whichever is less.
 - 7. Room Thermostats: Off-white enclosure capable of being mounted on a standard single gang electrical back box. Provide each with:
 - a. Local display of current space temperature.
 - b. Local setpoint adjustment (+/- 5 deg F) and temporary override button, both of which can be overridden by BAS at OWS.
 - c. RJ45 connection for connection to PDU.
 - 8. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
- C. RTDs and Transmitters:
 - 1. Accuracy: Plus or minus 0.2 percent at calibration point.
 - 2. Wire: Twisted, shielded-pair cable.
 - 3. Insertion Elements in Ducts: Single point; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft.
 - 4. Averaging Elements in Ducts: Use where prone to temperature stratification or where ducts are larger than 9 sq. ft; length as required.
 - 5. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
 - 6. Room Sensor Cover Construction: Off-white enclosure capable of being mounted on a standard single gang electrical back box.

- D. Pressure Transmitters/Transducers:
 - 1. Static-Pressure Transmitter: Non-directional sensor with suitable range for expected input, and temperature compensated. Accuracy of 2 percent of full scale with repeatability of 0.5 percent. Linear output of 4 to 20 mA.
 - a. Building Static-Pressure Range: 0- to 0.25-inch wg.
 - b. Duct Static-Pressure Range: 0- to 5-inch wg.
 - 2. Water Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig . operating pressure; linear output 4 to 20 mA.
 - 3. Water Differential-Pressure Transducers: Stainless-steel diaphragm construction, suitable for service; minimum 150-psig operating pressure and tested to 300-psig; linear output 4 to 20 mA.
 - 4. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.
 - 5. Pressure Transmitters: Direct acting for gas, liquid, or steam service; range suitable for system; linear output 4 to 20 mA.

2.5 STATUS SENSORS

- A. Low Limit Temperature Switch: Minimum 20 ft. element for freeze protection. Serpentine across the face of the coil and of sufficient length or number for three passes across the width of the coil it is protecting. Connect in series with other safety devices to de-energize fans serviced when a drop in temperature below setpoint is detected.
- B. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.
- C. Power Monitor: 3-phase type with disconnect/shorting switch assembly, listed voltage and current transformers, with pulse kilowatt hour output and 4- to 20-mA kW output, with maximum 2 percent error at 1.0 power factor and 2.5 percent error at 0.5 power factor.
- D. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.
- E. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
- F. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.

2.6 ACTUATORS

- A. Electric Motors: Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
 - 1. Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment".
 - 2. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
 - 3. Nonspring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 - 4. Spring-Return Motors for Valves Larger Than NPS 2-1/2: Size for running and breakaway torque of 150 in. x lbf .
 - 5. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 - 6. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.

- B. Electronic Actuators shall be of 0 10 VDC type. Direct-coupled type designed for minimum 60,000 full-stroke cycles at rated torque. The minimum actuator impedance shall be 800 ohms even when more than one actuator is connected in parallel. Spring return shall be required for two-position (NO/NC) control sequence or for steam valve control. Non-spring return actuators shall be used for all modulating sequence of control. They shall conform to all requirements of sequence descriptions specified or scheduled. Main mechanical equipment actuators shall have a manual position dial to allow manual positioning of valve in absence of control power.
1. Valves: Size for torque required for valve close off at maximum pump differential pressure.
 2. Dampers: Size for running torque calculated as follows:
 - a. Opposed-Blade Damper with Edge Seals: 5 inch-lb/sq. ft. of damper.
 - b. Opposed-Blade Damper without Edge Seals: 3 inch-lb/sq. ft. of damper.
 - c. Parallel-Blade Damper with Edge Seals: 7 inch-lb/sq. ft. of damper.
 - d. Parallel-Blade Damper without Edge Seals: 4 inch-lb/sq. ft of damper.
 - e. Dampers with 2- to 3-Inch wg of Pressure Drop or Face Velocities of 1000 to 2500 fpm: Increase running torque by 1.5.
 - f. Dampers with 3- to 4-Inch wg of Pressure Drop or Face Velocities of 2500 to 3000 fpm: Increase running torque by 2.0.
 - g. Nonspring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running torque of 150 in. x lbf and breakaway torque of 300 in. x lbf.
 - h. Spring-Return Motors for Dampers Larger Than 25 Sq. Ft.: Size for running and breakaway torque of 150 in. x lbf.
 3. Coupling: V-bolt and V-shaped, toothed cradle.
 4. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
 5. Fail-Safe Operation: Mechanical, spring-return mechanism. Provide external, manual gear release on nonspring-return actuators.
 6. Power Requirements (Two-Position Spring Return): 24-Vac.
 7. Power Requirements (Modulating): Maximum 10 VA at 24-V ac or 8 W at 24-V dc.
 8. Proportional Signal: 2- to 10-V dc or 4 to 20 mA, and 2- to 10-V dc position feedback signal with damper position indicator indicating percent of travel.
 9. Temperature Rating: Minus 0 degrees to plus 122 deg F.
 10. Actuator Housing: Molded or die-cast zinc or aluminum.
 11. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC."
 12. Size to operate with sufficient reserve power to provide smooth modulating action or two-position action.
 - a. Permanent Split-Capacitor or Shaded-Pole Type: Gear trains completely oil immersed and sealed. Equip spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
- C. Actuators for VAV Terminal Box Controllers shall be 24V floating point, 0-10Vdc, modulating and their position shall be readable in percentage open at the OWS.
- D. Actuators for smoke dampers shall be 24V floating point, 0-10Vdc, modulating and their position shall be readable as open or closed via end switch at the OWS.
- E. Actuators shall be Honeywell.

2.7 CONTROL CABLE

- A. Control cable shall be shielded.
- B. Control wire penetrating a plenum shall be plenum rated with a 25/50 smoke rating
- C. Control wiring ran through a vertical shaft more than 2 floors shall be installed in a continuous raceway and a pull box at each floor.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE, AND HANDLING

- A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment in other Sections, arrange for shipping of control devices to equipment manufacturer. Upon delivery the equipment manufacturer shall inspect shipment for visual damages. The Controls Contractor shall replace any damaged control equipment at no cost to the Owner.
- B. Provide factory shipping containers for each piece of equipment. Provide factory applied plastic end caps on each length of pipe and tube. Maintain cartons and end caps through shipping, storage and handling as required to prevent equipment and pipe-end damage, and to eliminate dirt and moisture from equipment and inside of pipe and tube. Where possible store equipment and materials inside and protected from weather. When necessary, to store outside, elevate well above grade and enclose with durable water-proof wrapping.

3.2 EXAMINATION

- A. Verify that power supply is available to all controllers, and electric actuators.

3.3 COORDINATION

- A. Coordinate location of temperature sensors, humidistats, and other exposed control sensors with plans and room finish details before installation.

3.4 INSTALLATION

- A. Install software in control units. Implement all features of programs to specified requirements and as appropriate to achieve sequence of operations.
- B. Connect and configure equipment and software to achieve sequence of operations specified.
- C. Mount all wall thermostats, and other exposed control sensors on dedicated electrical backboxes.
- D. Install averaging elements in ducts and plenums in crossing or zigzag pattern.
- E. Install damper motors on outside of duct in warm areas, not in locations exposed to outdoor temperatures.

3.5 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Install systems and materials in accordance with manufacturer's instructions, rough-in drawings and equipment details.
- B. The term "control wiring" is defined to include providing of wire, conduit, and miscellaneous material as required for mounting and connecting electric or electronic control devices.
- C. Install all control wiring in conduit for electric/electronic control systems. Conceal wiring, except in mechanical rooms and areas where other conduit and piping are exposed. UL plenum rated cable shall be allowed above accessible lift out ceilings, in air plenums and in other areas as approved by Architect and local and NEC codes.
- D. Stub conduit to above lift out ceilings. Plastic bushing shall be installed where the wiring exits the conduit to prevent damage.
- E. Properly support and run in a neat workmanlike manner all wiring and conduit. Run parallel to or at a right angle to building structure.
- F. Number-code or color-code conductors, excluding those used for individual zone controls, appropriately for future identification and servicing of control system.
- G. This section shall provide all line voltage power wiring required because of substitution of equipment specified in this section.
- H. Install line voltage wiring in rigid conduit.
- I. Install signal and communication cable according to following:
 - 1. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.

2. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
 3. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
 4. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.
- J. Connect manual-reset limit controls independent of manual-control switch positions. Automatic duct heater resets may be connected in interlock circuit of power controllers.
- K. Connect hand-off-auto selector switches to override automatic interlock controls when switch is in hand position.
- L. Unless indicated otherwise, mount room sensors (i.e. thermostats and sensors for room control) immediately inside of door adjacent to light switch.
1. Where a light switch is not located immediately inside of door, mount sensor within room where it is best suited to sense true space conditions for proper operation and controllability of equipment serving the room.
 2. Unless indicated otherwise mount sensor at 48 IN above finished floor or as indicated on the Drawings.
- M. Identification:
1. Provide laminated plastic nameplates for control panels. Other equipment devices furnished, including sensors, switches, valves, gages, actuators and all other item furnished under this section shall be identified with plastic embossed labels adhered to the device. Each nameplate shall identify the function, such as "mixed air low limit" or "cold deck temperature sensor" Laminated plastic shall be one-eighth inch thick whiter with black center core. Nameplates shall be a minimum of 1 inch by 3 inch with minimum one quarter inch high engraved block lettering. Nameplates for devices smaller than 1 inch by 3 inch shall be attached by a nonferrous metal chain. Submit a schedule of proposed wording of each nameplate with hardware submittal.
 2. Instrumentation and Control Diagrams: Provide framed drawings including the sequence of controls and verbal description in laminated plastic showing complete diagrams for all equipment furnished and interfaces to all existing equipment, at each respective equipment location. Condensed operating instructions explaining preventive maintenance procedures methods of checking the system for normal safe operation and procedures for safely starting and stopping the system manually shall be prepared in typed form, framed as specified for the diagrams and posted beside the diagrams. Proposed diagrams, instructions and other sheets shall be submitted prior to posting.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
 2. Test and adjust controls and safeties.
 3. Test each point through its full operating range to verify that safety and operating control set points are as required.
 4. Test each control loop to verify stable mode of operation and compliance with sequence of operation. Adjust PID actions.
 5. Test each system for compliance with sequence of operation.
 6. Test software and hardware interlocks.

COLLIN COUNTY BAS UPGRADE FOR JACK HATCHELL ADMINISTRATION BUILDING

- C. Controls Verification:
 - 1. Verify that instruments are installed before calibration, testing, and loop checks.
 - 2. Check instruments for proper location and accessibility.
 - 3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
 - 4. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
 - 5. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
 - 6. Check temperature instruments and material and length of sensing elements.
 - 7. Check control valves. Verify that they are operating in the correct direction.
 - 8. Check dampers. Verify that proper blade alignment, either parallel or opposed, has been provided.
 - 9. Check control system as follows:
 - a. Verify that controller power supply is from emergency power supply, if applicable.
 - b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
 - c. Verify that spare I/O capacity has been provided.
 - d. Verify that controllers are protected from power supply surges.
- D. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.7 ADJUSTING

- A. Calibrating and Adjusting:
 - 1. Calibrate instruments.
 - 2. Make three-point calibration test for both linearity and accuracy for each analog instrument.
 - 3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
 - 4. Control System Inputs and Outputs:
 - a. Check digital inputs using jumper wire.
 - b. Check digital outputs using ohmmeter to test for contact making or breaking.
 - c. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.
 - 5. Flow:
 - a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
 - b. Manually operate flow switches to verify that they make or break contact.
 - 6. Pressure:
 - a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.
 - b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.
 - 7. Temperature:
 - a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
 - b. Calibrate temperature switches to make or break contacts.
 - 8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
 - 9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
 - 10. Provide diagnostic and test instruments for calibration and adjustment of system.

11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.
 - B. Adjust initial temperature and humidity set points.
- 3.8 DEMONSTRATION & TRAINING
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls. Refer to Division 01 Section "Demonstration and Training."
 - B. Upon system acceptance provide a minimum of five (5), six (6) hour general classroom training sessions for three (3) of the Owner's personnel in the operation, programming, troubleshooting and maintenance of the control system. Training sessions shall be videotaped by the BAS contractor and tapes/digital files turned over to the Owner at completion of training along with a log book to document follow training issues.
 1. Training to occur at manufacturer's local training facility.
 2. Travel, room and board at Owner's expense.
 3. Class size to be limited to five (5) operators at a time.

END OF SECTION

**PRODUCT SUBSTITUTION
REQUEST FORM**

Project: BAS Upgrades
Project ID 2025-266
To: _____
Reference: Collin County Admin Building

Substitution Request No: _____
From: Daikin Applied
Date: _____
A/E Project No: _____
Contract For: _____


Specification Title: Management Level and Programmable Field Equipment Controllers
Section: 230900 Page: 5 Article / Paragraph: 2.2 & 2.3

Proposed Substitution: Honeywell Optimizer
Manufacturer: Honeywell Address: _____
Telephone: _____ Proposed Model No.: Optimizer suite

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.


Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its installation.

- The undersigned certifies:
- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
 - Same warranty will be furnished for proposed substitution as for specified product.
 - Same maintenance service and source of replacement parts, as applicable, is available.
 - Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
 - Proposed substitution does not affect dimensions and functional clearances.
 - Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by substitution.

Submitted By: Gregory Hewitt Signed: 
Firm: Daikin Applied Address: _____
Phone: 832.714.0184

A/E's REVIEW & ACTION

- Substitution approved - Make submittals in accordance with Project Manual requirements.
- Substitution approved as noted - Make submittals in accordance with Project Manual requirements.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

A/E Signature:  Date: 10/17/2025

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____